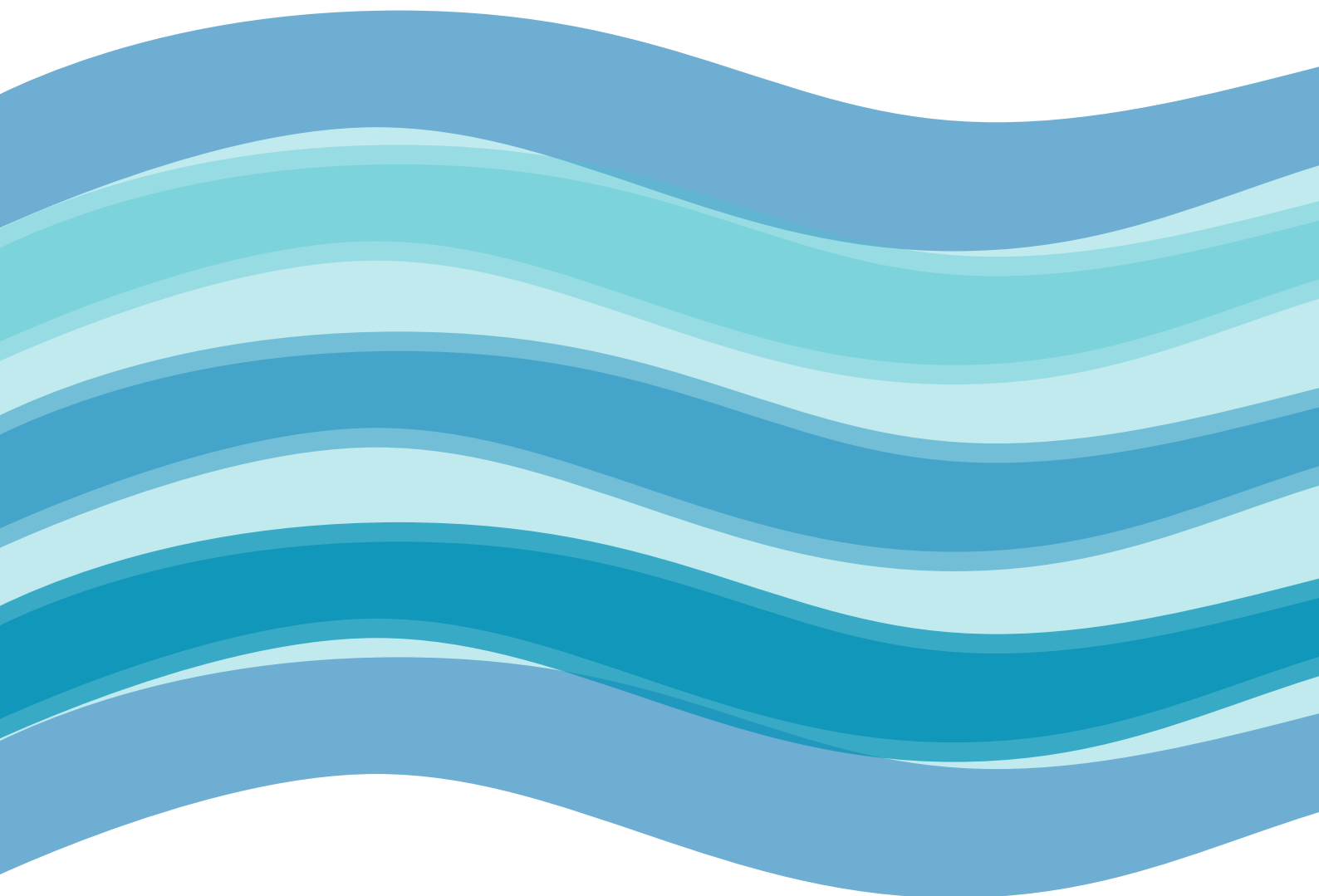


The process of developing the water supply and sanitation strategy for emerging towns in Laos



Water Governance Facility Report No 7
Lessons From the Field – GoAL WaSH
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GoAL WaSH – Governance Advocacy and Leadership in Water Sanitation and Hygiene – is part of the UNDP Water and Ocean Governance Programme and is coordinated by the UNDP Water Governance Facility at SIWI. It targets countries with low water and sanitation coverage. GoAL WaSH supports work in three areas; 1) Identifies gaps, needs, constraints and opportunities in national water and sanitation plans, strategies and capacities, 2) supports development and reform of action plans, policies, laws, coordinating mechanisms and regulatory functions and, 3) supports implementation with accountability and transparency.

About Lessons From the Field

The Lessons From the Field is a Knowledge Management initiative established under the GoAL WaSH programme. The aim is to generate a collection of publications and other products, such as short films, that will gather knowledge of relevant national governance related processes that have occurred at country level during GoAL WaSH implementation.

The Lessons From the Field reports provide an in-depth look at the changes that these processes have triggered and the key aspects that made them possible. They are thus a special category in the Water Governance Facility Report series.

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Abbreviations

ADB	Asian Development Bank	NORAD	Norwegian Agency for Development
AFD	Agence Française de Développement	NSEDP	National Socio-Economic Development Plan
BNP	Branch Nam Papa	ODA	Official development assistance
BOQ	Bill of quantities	OPWT	Office of Public Works and Transport
BORDA	Bremen Overseas Research and Development Association	PM	Prime minister
DEWATS	Decentralised wastewater treatment systems	PMU	Project Management Unit
DDD	Digital Divide Data	PNP	Provincial Nam Papa
DHUP	Department of Housing and Urban Planning	PPP	Public-private partnership
DPWT	Department of Public Works and Transport	SDGs	Sustainable Development Goals
DWS	Department of Water Supply	SIP	Sector investment plan
GIS	Geographic information system	SIWI	Stockholm International Water Institute
GMS	Greater Mekong Subregion	SOE	State-owned enterprise
GRET	Groupe de Recherches et d'Echanges Technologiques	STWSP	Small Towns Water Supply Project
IFAD	International Fund for Agricultural Development	UDAA	Urban Development Administration Authority
IT	Information technology	UDD	Urban Development Division
JICA	Japan International Cooperation Agency	UN-Habitat	United Nations Human Settlements Programme
JMP	Joint Monitoring Programme	UNICEF	United Nations Children's Fund
KOICA	Korea International Cooperation Agency	WASA	Water Supply Authority
Lao PDR	Lao People's Democratic Republic	WASRO	Water Supply Regulatory Office
LDC	Least developed country	WHO	World Health Organisation
LPRP	Lao People's Revolutionary Party	WREA	Water Resources and Environment Administration
MDGs	Millennium Development Goals	WSD	Water Supply Division
MEK-		WSP	Water and Sanitation Program
WATSAN	Mekong Region Water and Sanitation Programme	WSRC	Water Supply Regulatory Committee
MOH	Ministry of Health	WSSP	Water supply and sanitation sector project
MOHA	Ministry of Home Affairs	WTP	Water treatment plant
MONRE	Ministry of Natural Resources and Environment		
MPWT	Ministry of Public Works and Transport		
NCRWSSP	Northern and Central Regions Water Supply and Sanitation Sector Project		
NEDA	Neighbouring Countries Economic Development Cooperation Agency		
NGO	Non-governmental organisation		
NGPES	National Growth and Poverty Eradication Strategy		

Executive summary

The more than one billion people living in small and emerging towns without access to water and sanitation services has become a major global concern in recent decades. Typically, these settlements have a relatively small but rapidly increasing population and a mixture of urban and rural characteristics. They don't fit neatly into the water and sanitation sector, in which water supply systems are traditionally "urban" or "rural", where urban services are larger, more complex, and operated by a utility as opposed to the simpler, community-operated rural systems. With different agencies commonly responsible for urban and rural services, many small and emerging towns that are viewed as neither urban nor rural have fallen into a gap in service provision. This has been the case in Laos, where a large portion of the population lives in small urban centres. This report looks at steps that have been taken to put emerging towns on the political agenda in Laos, leading to an increase in water supply and sanitation services in emerging towns. The particular foci of the report are the Water Supply & Sanitation Sector Strategy for Emerging Towns (hereafter referred to as the emerging town strategy) and the Lao National Water Treatment Plant Database, both produced with the support of the GoAL WaSH programme. In the classification of Lao settlements, the emerging town is a category which has been formally identified. This is a category of settlement that commonly lacks water supply and sanitation services. Criteria include a population of between 2,000 and 4,000, a degree of coherence, and development potential. The development of a specific definition has allowed the Ministry of Public Works and Transport (MPWT) to develop an emerging town strategy with the aim of ensuring the provision of services to emerging towns. In line with decentralisation policies, responsibilities for water supply and sanitation lie with local authorities, with management carried out by provincial water utilities which operate as state-owned enterprises.

The emerging town strategy was developed through the GoAL WaSH programme. The strategy was prepared by a consultant team and was a collaborative effort between the Department of Housing and Urban Planning (DHUP) of MPWT, and UN-Habitat. An urban water sector strategy had previously been developed which focusses on existing towns as opposed to emerging towns, and the strategy for emerging towns was designed to complement the existing urban water strategy. The emerging town strategy has three goals which apply

specifically to emerging towns. These relate to legislation and policy reform; capacity building; and monitoring the performance of the emerging town sector. So far the strategy has led to some early measures in the sector, with a number of piped water supply systems being constructed in or extended to emerging towns.

A second output of the GoAL WaSH programme is a database of water treatment plant (WTP) designs. The intention was to provide a tool to assist in implementation of the emerging town strategy. This was to be done through an online database that was accessible to all relevant stakeholders, providing water utilities with a range of WTP designs from which they could select one that was appropriate for their context. This reduces the need for external consulting services, thereby lowering the cost and building the capacity of local staff. The main stages in developing the database were the development and construction of the database structure, collection of available data, and conversion of the data into the required format for the database. On completion of the database, representatives of the provincial water utilities and other relevant stakeholders were trained in its use. An IT company was contracted to provide refresher trainings and to maintain the database for three years, after which time the responsibility for maintenance was to be transferred to MPWT.

Several factors contributed to the ability to produce a strategy for emerging towns in Laos. These included recognition of the problem, a clear definition of emerging towns, ownership and support of the strategy by the central Government, support from development partners, harmonisation and complementary inter-agency relationships, and a policy framework that has the flexibility for additional components to be integrated. Although the emerging town strategy and database have had positive impacts on the sector, there have been challenges in their development and use. A key challenge is the difficulty in accessing data. Although the database is designed to alleviate this difficulty with regard to WTP designs, there is an associated issue, which is the dissemination of information. In addition to providing information about the database, encouragement and support in its use are particularly important because there is limited confidence and skill in information technology.

Recent restructuring in MPWT has seen the creation of a Department of Water Supply (DWS). Associated changes

include the preparation of an overarching water and sanitation policy, and revisiting existing strategies, with an eye to potentially incorporating the strategies into one document. It is likely, therefore, that the emerging town strategy will become part of a broader strategy. Regarding the database, there are ideas to expand its content to include additional data.

With an increasing portion of the Lao population living in emerging towns, increasing their political profile is essential for meeting development goals. The emerging town strategy has been a crucial step in highlighting emerging towns in the water and sanitation sector. With increasing capacity and coordination in the sector, it is hoped that both the strategy and the WTP database will make a valuable contribution to increasing the provision of water supply systems and sanitation services in emerging towns.

Introduction

GoAL WaSH | Since 2011, the GoAL WaSH programme has been active in Laos, and the second phase is now being implemented in neighbouring countries as well. The Water Supply & Sanitation Sector Strategy for Emerging Towns and the Lao National Water Treatment Plant Database, which are the subject of this paper, were outputs of the first phase. Since they were produced, the programme has carried out trainings for water and sanitation sector stakeholders on consumer rights and the socio-economic effects of water tariffs. The current phase is working to improve the performance of selected water utilities through the development of standard operational procedures based on ISO standards on social responsibility (ISO 26000) and quality management systems (ISO 9000).

UN-Habitat | The United Nations Human Settlements Programme (UN-Habitat) is the United Nations programme working towards a better urban future. Its mission is to promote socially and environmentally sustainable human settlements development and the achievement of adequate shelter for all. UN-Habitat was established in Laos in 2005, and works under the Urban Basic Services Branch of the programme. Its major water and sanitation programme in Laos has been the Mekong Region Water and Sanitation Initiative (MEK-WATSAN), which aimed to support the Government in its work to attain the wa-

ter and sanitation targets of the MDGs. The programme implemented a community-based model to supply safe water and sanitation to small towns and peri-urban areas in eight provinces. Through its extensive experience in working with the Government and water and sanitation sector stakeholders, UN-Habitat has gained a first-hand understanding of the issues facing emerging towns with regard to water supply and sanitation.

The GoAL WaSH Programme and UN-Habitat share a recognition that the task of sustainably providing safe water and sanitation is as much a matter of governance as it is of providing hardware. The common goal of enhancing water governance brought the respective agencies together. In consultation with Government, the need was expressed for a strategy that meets the unique needs of emerging towns. As a result, the preparation of such a strategy was brought into the GoAL WaSH programme. In addition, the benefits of a database of water treatment plant (WTP) designs were seen as an innovative way to assist local stakeholders in constructing WTPs with maximum efficiency, thereby contributing to the implementation of the emerging town strategy. The experiences of stakeholders in developing the emerging town strategy and the database are shared here in the hope that other countries may recognise similar issues and build upon the experiences of Laos.



Photo: UN-Habitat

Methodology

The research for this report was carried out in 2016. Consultations with SIWI and UN-Habitat representatives provided the basis of the research. A review was then carried out of key literature from around the world which related to the provision of basic services in small and emerging towns. Turning to Laos, a detailed study was made of the Water Supply & Sanitation Sector Strategy for Emerging Towns and the Lao National Water Treatment Plant Database, as the subjects of the study. Other Lao documents reviewed include Government documents, outputs and project documents from development partners, and other project documents from the GoAL WaSH project, which produced the strategy and database. A list of Lao documents reviewed is provided in Annex 1. In addition to the desk review, semi-structured interviews were carried out with key stakeholders. The people interviewed are shown in Annex 2. They include UN-Habitat staff, key personnel from the Ministry of Public Works and Transport, and managers from a sample of the provincial water utilities.

The report draws heavily on the experiences of UN-Habitat staff who were involved in all phases of the project.

Small and emerging towns

The significance of small and emerging towns is bolstered by statistics showing that more than one billion people without adequate access to water live in small urban centres or in “large villages” that have urban characteristics. The number of people living in such centres who lack adequate provision for sanitation is even greater. The majority of the centres are in low and middle-income countries, where small towns were predicted, in 2006, to contain much of the increasing urban population in the near future (UN-HABITAT, 2006).

Defining small and emerging towns | In much of the world, areas are classified as either rural or urban. This does not reflect a rural-urban continuum which was seen as a more realistic representation of human settlements (Pilgrim, 2007; Hopkins, 2003). A settlement may move from a rural to an urban area through natural population growth; rural-urban migration; or the classifying of a formerly rural settlement as urban due to its expansion (Swain, 2013). A reclassification of a settlement from rural to urban poses problems because it often lacks the human and financial capacity to manage itself as an urban centre. In the last three decades settlement systems have become increasingly complex, and urban functions have diffused over broad geographic areas (Cohen, 2006). There is no universal definition of small towns and indeed a small town may be classified as rural in one country and as urban in another country. While classification systems differ, there are some characteristics associated with small towns. Generally, settlements are classified according to their size, administrative role or economy (UN-HABITAT, 2006). The most common method classifies towns according to their population (Mugabi & Njiru, 2006). Globally, there are statistics based on the definition of a small urban area as having less than half a million inhabitants and being defined as an urban centre by the national government of the country in which it is found (UN-HABITAT, 2006). However, many countries define small urban centres as having a population considerably smaller than half a million, with the lower population threshold being sometimes in the vicinity of 2,000. Settlements of a similar population size vary greatly in other characteristics, including the nature of their economy. Rural settlements are characterised by a dependence on agriculture, while the economy of urban settlements is more diverse with a greater emphasis on industry and service. Many small towns are the market centre for surrounding rural areas and may include businesses related to agriculture such as food processing.

The third method of classification is the administrative role of a settlement. An administrative town may be the base for local government and for public services such as education, medical care, communication, police and courts. A fourth difference between urban and rural centres is in the social system. Rural centres are often less diverse in their makeup, and traditional structures and decision-making practices still apply, resulting in a more cohesive system than is found in larger, more diverse urban centres. While large urban centres may contain all the urban characteristics described above, there are many smaller centres which exhibit both urban and rural characteristics.

As with small towns, there is not a universal definition of emerging towns and in some contexts the two terms are used interchangeably. The idea of an emerging town as it is applied in this report is a formerly rural settlement or group of rural settlements that is rapidly developing urban characteristics. The settlement is therefore in the process of developing from a rural settlement into an urban settlement.

Urbanisation and emerging towns in Laos | The majority of Laos' population lives in rural areas. It was estimated that 37.6 percent of the population were urban dwellers in 2014, up from only 15.4 percent in 1990 (ADB, 2015). In terms of rural and urban characteristics, most towns in Laos have a small population, and in 2012 there were only 10 towns with a population greater than 20,000 (ADB, 2012). Regarding economic characteristics, there is still a large emphasis on agriculture, with 72.2 percent of workers employed in the agriculture sector in 2010 (ADB, 2015). For administration purposes, there is a set hierarchy of towns, which includes towns in the upper four levels of Table 1.

For a long time district towns were the lowest level of town on the hierarchy. As the capital of a district, district towns are municipalities, a term which refers to an autonomous entity which has the ability to generate revenue (Sisoulath, 2011). Although many district towns have a small population, their administrative status as district towns ensures that they have a profile which entitles them to benefits. There are many other developing areas which do not fit into the category of district towns.

Table 1: Hierarchy of towns in Laos

Category	Number of settlements in category	Names of main cities	Population range in category
Capital city	1	Vientiane	320,000 (main 4 urban districts)
570,000 (9 districts in Vientiane Prefecture – “Greater Vientiane”)			
Secondary towns	4	Savannakhet, Pakse, Thakhek, Luang Prabang.	38,000-82,000
Other provincial capitals	12		6,000-38,000
District towns	106		500-15,000
Small and emerging towns	Circa 130		2,000+
Villages	11,000 – 12,000		

As part of a 1999 global study of management models for water supply and sanitation services in small towns, the Government carried out a study of the status of small town water and sanitation services in Laos, producing a report of the study in 2002 (WASA; DHUP; URI., 2002). The study was carried out shortly after the Government and the Asian Development Bank’s (ADB) initial attempts to develop criteria for classifying different levels of urban settlement in the context of water supply. In the water sector, previously developed criteria required towns to have a population of between 4,000 and 20,000 by 2010, in order to qualify for a piped water system. The 2002 small town study predicted that a significant number of more than 50 small towns would still have a population of less than 4,000 by 2010, rendering them ineligible for a piped water system. The study also focused attention on the most suitable management models for small towns, the most appropriate institutional setup, and the flexibility of systems in adapting to changing needs. In a concurrent study, the National Urban Rural Basic Infrastructure Project (NURBIDS) identified 198 urban growth centres, and found that 68 percent of the population resided within a 15 kilometre radius of the growth centres.

The need to expand the definition of Lao towns is recognised by the central government level and by local authorities. The reality has been that there are settlements which have a bigger economy than their district capital, even though they are not administrative centres. Some of these settlements have a developing urban infrastructure and a clear potential to develop as a town. District towns are attracting the attention of the authorities for the provision of water and sanitation, even if they are relatively underdeveloped as a town. The towns that have been neglected are those which have no administrative func-

tion. These are now known as small and emerging towns. ADB projects for small towns have targeted towns with a population of at least 4,000. Emerging towns are smaller and are typically clusters of villages which are experiencing rapid population growth. Many have been clustered according to the requirements of Politburo Resolution No 3. The Ministry of Home Affairs has recently been further defining emerging towns, with the recognition that there are needs unique to this category of settlement. Sectors are required to formulate a strategy for the development of emerging towns. The Department of Housing and Urban Planning (DHUP) of the Ministry of Public Works and Transport (MPWT) has defined emerging towns, for its purposes, as shown in Box 1. In 2013, there were 1,070 officially designated “village clusters”. Some of the village clusters are classified as emerging towns, and some towns which were classified as small towns in the Sector Investment Plan are emerging towns under DHUP’s criteria. The delineation between small and emerging towns was still being clarified at the time the emerging town strategy was written. With rapid urbanisation and an estimated population growth rate of 2 percent, the number of village clusters, small towns and emerging towns is continuously increasing. The lowest administrative unit is the village, which does not automatically meet the criteria of a town.

The upper levels of the hierarchy have drawn the focus of infrastructure development (Lainé, 2015). The Asian Development Bank (ADB) funded a programme in the 1990s for the purpose of urban infrastructure development in the four secondary towns. This was followed by a second programme for water supply and sanitation in 21 district towns, in a move to improve the infrastructure in small towns.

Box 1: Explanation of emerging towns in the Lao water and sanitation sector

The term emerging towns is used in terms of Resolution No 3 to identify those clusters of villages that have developed some coherence, show development potential and meet a set of criteria prepared by DHUP, including population in the range 2000–4000, and a target population density. The term is not mutually exclusive to the term “small towns”. Established criteria may define an emerging town and may also establish whether it has the potential to be defined as a small town in the future.



Sanxay in Attapeu province is one of many villages with 2,000 to 4,000 inhabitants that can be classified as an emerging town.

Photo: UN-Habitat

Water supply and sanitation services in small and emerging towns

Traditionally, centralised water supply systems have been established by governments in major urban centres, while a concern with social justice has led many non-governmental organisations (NGOs) to concentrate on poor, rural areas. Small and emerging towns¹ are a different type of settlement than cities and rural villages. The focus on urban centres and rural villages has resulted in a situation where small and emerging towns are overlooked, and consequently they have some of the lowest levels of service in water supply and sanitation. The dynamics leading to this gap in services were rarely analysed and poorly understood until recent years, when there has been a growing body of literature concerned with finding solutions to the challenges of water supply and sanitation for small and emerging towns.

Taking into account the generally accepted ways of classifying towns and the specific needs relating to water supply and sanitation, Pilgrim et al. (2007, p. 77) describe towns which "...straddle rural and urban spaces and have unique characteristics that make it difficult to apply either urban or rural strategies to them." In an effort to clarify the definition of a small town as it applies to the water sector, a worldwide e-conference developed the following definition in 2000:

Small towns are settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped water supply systems, but too small and dispersed to be efficiently managed by a conventional urban water utility. They require formal management arrangements, a legal basis for ownership and management, and the ability to expand services to meet the growing demand for water. Small towns usually have populations between 5,000 and 50,000 inhabitants, but can be larger or smaller (Ndaw, 2016, p. 3).

It is the inappropriateness of established ways of dealing with both urban and rural centres that make the class of small towns significant in the water and sanitation sector. Small town characteristics include low densities, lower incomes, lack of institutional capacity and often the availability of alternative water sources (Ndaw, 2016). Many

small towns have a population density and economic activities that warrant the provision of a collective system for water supply and sanitation. Yet they don't have the economy of scale or population density required for a large system as those in urban areas. Traditionally, rural areas have been serviced by simpler systems which are managed by the community, whereas urban areas have had systems which are technologically and institutionally more complex, often operated by a utility. Towns that fall in the gap between rural and urban require systems that can deal with rapid population growth and be operated and maintained using lower financial and human resources than are present in large towns. This is the challenge for governments.

Many of the factors that challenge water supply and sanitation in small and emerging towns are not technological in nature. The institutional setup has a major influence, with multiple government agencies often having responsibilities. It has been said that the level of government is a more influential factor than the sector to which an agency belongs. (UN-HABITAT, 2006). Agencies responsible for water supply and sanitation may belong to any number of sectors including public works, health and environment. They may be from a national, provincial or local level. This has been influenced by the decentralisation policies which have been implemented in many countries. Cohen (2006) notes that democratisation, decentralisation, political pluralism and the increasing influence of civil society have all impacted urban governance, resulting in a pressing need to build capacity in local governments. If local governments are given responsibility for water supply and sanitation, they must also have the authority and the capacity to establish effective systems. Many local authorities lack the necessary capacity (Satterthwaite & Tacoli, 2003; Ndaw, 2016). In terms of the sector many countries have multiple ministries with responsibilities related to water and sanitation. Often water and sanitation are mandated to different ministries, and there is also a rural/urban division. These divisions serve to further entrench the dichotomous nature of the rural/urban classification of towns.

In countries with limited resources, the distribution of resources is a challenge to national governments. Many governments allocate resources based on the respective urban and rural populations (Hopkins, 2003). In this context, the classification of a marginal town can have major funding implications. Effective use of resources is a key goal. Therefore, there is a need for services which require a minimum capital investment and which are cost-effective to operate – to the point when revenue and loans are able to finance future costs (Pilgrim N. R., 2007; Pilgrim, Roche, Revels, Kingdom, & Kalbermaten., 2004).

The solution to the lack of service provision in small towns, as phrased by UN-Habitat (2006, p. 2), consists of "... more competent, effective local water and sani-

tation providing organizations in tens of thousands of small urban centres in which the unserved and inadequately served have influence." The statement is made with the recognition that each town is in a unique situation and the nature of the organizations providing services will likewise be diverse. In a review of developments relating to small town water services, Adank (2013) concludes there is increasing demand for small town services that lie somewhere in between traditional rural models with community-based management, and those of urban areas which are managed by a utility. There is an ongoing search for ways to increase the professional capacity of service providers; achieve clarity on service authority, support and regulatory functions, with sufficient human and financial resources; as well as clarity of ownership arrangements and financial mechanisms (Adank, 2013).

Development in Laos

With an area of 236 800 km² and an estimated population of 6.8 million in 2015, (UNFPA, 2015) Laos is a land-locked country that borders Thailand, Cambodia, Vietnam, China and Myanmar. For the first half of the 20th Century, Laos was governed as a province of French Indochina. In this period, little was achieved in the way of development. After Laos achieved independence in 1954 Laos was engulfed in war. The Lao PDR was proclaimed by the Lao People's Revolutionary Party (LPRP) at the end of 1975. With a large number of people fleeing the country during or shortly after the war, the Government of Laos faced the formidable task of building a nation, particularly considering the previous low levels of investment and development in the country. With regard to urbanisation, 1975 marked the beginning of an era of state control of urban management.

Laos is considered one of the least developed countries (LDC). However, the Government has a goal, set in 1996, to graduate from the list of LDCs by 2020. This is to be achieved through a structured development plan

aiming at reducing poverty. Shorter term goals have been articulated in five-year National Socio-economic Development Plans (NSEDPs), based on the National Growth and Poverty Eradication Strategy (NGPES). The NSEDPs cover a five-year period, with the Seventh NSEDP (2011–2015) focussing on industrialisation and modernisation. The plan incorporated the achievement of the Millennium Development Goals by 2015, and had poverty reduction as a key focus. In the economic sector, water and sanitation targets for 2015 were for 65 percent of the number of people residing in urban areas of the country to have access to piped water. There was to be continued improvement of the water supply system in main cities, and new systems were to be constructed in smaller cities and kumbans (village clusters), with an emphasis on quality of service, cleanliness and sustainability. Social targets were to increase access to clean water to 80 percent of the population and to increase the use of toilets to 60 percent of the population. The sanitation target was reached, according to estimates by the WHO/UNICEF Joint Monitoring Programme (JMP), but the 2015 level of water supply fell short of the Govern-

ment's target of access for 80 percent of the population. Laos achieved the MDG target to halve the portion of the population without sustainable access to safe drinking water and basic sanitation. The coverage for sanitation and water supply, as measured by the JMP, is shown in Table 2. Coverage in emerging towns is closer to that of rural areas than urban ones.

The geographical focus of development has been guided by the creation of economic corridors through the Greater Mekong Subregion (GMS), launched by ADB. The aim of the economic corridors is to "...maximize the economic benefits of increased trade and traffic flows along the major transport corridors in the GMS with the expected positive impacts resulting from accelerated investments in strategically located towns and cities, and added value on economic growth through development oriented on green growth and climate resilience" (ADB, 2015b, p. 1.). ADB has invested in towns along the economic corridors and this has resulted in increased migration to these towns.

¹ The phrase "small and emerging towns" is used in this section with the recognition that both terms are used by different countries and different stakeholders to describe settlements exhibiting the characteristics described in the section. The term "small towns" should be read in this section to include emerging towns.

Water supply and sanitation services in Laos

Water supply overview | Piped water supply had its beginnings in Laos when a system was constructed in Vientiane Capital in the era of French rule. More investment was made in the 1970s in Vientiane Capital and in the secondary cities, and by the 1990s there were investments in the major provincial capitals. Water supply was seen as a prerequisite for economic growth and achievement of the Government's development goals. Once systems had been established in all the provincial capitals, attention shifted to the next level of the hierarchy which was the district towns. The late 1990s saw the adoption of a sector approach to the development of water supply systems. The new approach aimed to increase sustainability and build capacity in the relevant line agencies. Under this approach, ADB has been investing in small towns, for which one criterion is a population of at least 4,000.

While urban water supply has been focused on settlements further down the hierarchy of towns, other development actors have been working separately in rural water supply. Rural water supply projects are typically implemented at the village level and operated and maintained by a village committee. There have been some issues with the sustainability of water supply systems, and capacity building is ongoing within the National Centre for Environmental Health and Water Supply – Nam Saat – in order to increase the effectiveness of rural water supply interventions. Many rural water supply projects have been implemented in remote villages, as opposed to villages bordering on peri-urban areas or emerging towns. Since urban water supply is focused on towns down to the level of small towns, and rural water supply is concentrated on rural villages, there is a gap in services for emerging towns.

Institutional, legal and policy framework for water supply | The institutional framework for water supply has been restructured more than once in an effort to improve its effectiveness. Figure 1 (Reference source not found) shows the water supply institutional framework at the time the emerging town strategy was written. Prior to 1998, piped water supply had been administered through provincial branches of a national state-owned enterprise operating under the authority of DHUP. A foundational policy statement in 1999 (Prime Minister Decision No. 37 on Management and Development of Water Supply and Wastewater Sector) confirmed the role of the central Government

as facilitator and coordinator of development for water supply and centralised wastewater management systems. However, in line with the goal of decentralisation, the national state-owned enterprise was restructured, and a state-owned enterprise, Nampapa Nakhon Luang, was established to operate water supply in Vientiane Prefecture. In addition, provincial Nam Papas (PNPs) were created as provincial state-owned enterprises responsible for urban water supply in their respective provinces. The 1999 policy statement set the goal of 80 percent coverage of the urban population with piped water supply by 2020, a target which has guided sector development through to the present time. The Water Supply Authority (WASA) was established and provisions were made for a Water Supply Authority Board under MPWT. The policy statement was accompanied by a Sector Investment Plan (SIP). In 2004, small, poor towns were given increased priority in the SIP in line with the Government's wish to achieve equitable development throughout the country. Since the passing of the 2009 Water Supply Law, there are four key sector actors:

(i) The Government, including the legislative body or National Assembly, ministers and provincial governors, makes all major sector decisions, as well as approving legislation and policy, and regulating the sector with advice from MPWT/DPWT. Since 2000, there has been a move to decentralise the functions of development planning, budgeting, tax collection and implementation.

(ii) MPWT plans, manages and coordinates the sector at a national level, including the coordination of national and international partners in resource mobilisation. At the time the emerging town strategy was written, the sector was managed through the Water Supply Division (WSD) of DHUP. At the beginning of 2016, water supply and sanitation was elevated to department level and throughout 2016, responsibilities are being transferred from DHUP to the new Department of Water Supply (DWS).

(iii) The DPWTs plan, manage and coordinate the sector at the provincial level, and report to the Office of the Provincial Governor and MPWT.

(iv) Service providers, the majority of which are PNPs, although there are a small number of private concessionaires. PNPs are managed by a board of directors of which the deputy chairperson or chairperson is the director of DPWT. PNPs manage and make investments

in the water supply system on behalf of the Government, which owns all assets in the country. Their capacity is generally low, particularly in the areas of business and financial management.

To carry out regulatory functions, the Government established the Water Supply Regulatory Committee (WSRC) and its secretariat, the Water Supply Regulatory Office (WASRO), in 2008. With a mandate to regulate the water supply sector by creating an enabling environment, and to promote and facilitate the water supply service providers to efficiently operate their business based on market mechanisms under the state regulations, the WSRC, through WASRO, carries out a range of activities which include monitoring and assessing the service performance of the water supply sector. Although WASRO officially has a regulatory function, it also provides support in a mentoring capacity, particularly to remote provinces which have a low staff capacity.

Urban water supply and sanitation has functioned separately from rural water supply and sanitation, and there has been no national strategy combining the urban and rural water supply sectors. The first national strategy for rural water supply and sanitation was adopted in 1997. It specified that new investments were to be made through a bottom-up, demand-responsive approach. In 1998, following adoption of the strategy, the National Centre for Environmental Health and Water Supply (Nam Saat) was established within the Ministry of Health (MOH), with responsibility for rural water supply, plus sanitation and hygiene promotion in both urban and rural areas. The national, provincial and district Nam Saat are the entities most involved with water supply. Updates to the rural water supply and sanitation strategy have included prioritising poor and remote communities. MOH's primary goal is to enhance public health including through providing support to community water supply management. There was previously a tendency for Nam Saat to refrain from working in emerging towns since the towns were too big for the rural systems with which Nam Saat has experience. At the same time, MPWT avoided emerging towns on the grounds that the towns were rural and therefore not part of their jurisdiction.

In 2000, Prime Ministerial Instruction 01/PM aimed to decentralise to the sub-national levels the functions of development planning, budgeting, tax collection and implementation. Provinces were seen as strategic units, districts as budget planning units and villages as implementing units in a policy which is known as Sam Sang ("Three Builds"). The Sam Sang policy comprises three complementary dimensions: political, administrative decentralisation and development (Laos-Australia Development Learning Facility, 2015). Sam Sang was piloted from 2012 to 2015. Outcomes of the pilot phase include strengthened village and district organizations, the preparation of village and district development plans, and devolved functions including revenue collection and

investment approval. The details of Sam Sang implementation were not well understood by all levels and there was limited success. A 2015 study found that administrative decentralization began well under Sam Sang in 15 targeted Ministries, but the required administrative budget had not yet been allocated to enable lower levels to carry out their new functions (Laos-Australia Development Learning Facility, 2015). This is a critical step in what is seen as a long-term and complex undertaking. Instruction 01/PM supported decentralization which was taking place in the urban water sector through the devolving of responsibility to provincial water utilities. A later piece of relevant legislation was the 2005 Enterprise Law. The law encouraged private sector participation and obliged provincial water utilities to operate as fully autonomous state-owned corporate entities, and to adopt a commercial orientation to their operations. Under the 2008 Water Supply and Sanitation Sector Roadmap, a water supply and sanitation strategy was to be incorporated into MPWT's overall urban sector strategy, which emphasises the higher level towns down to the district capitals. In addition, basic infrastructure was to be constructed for smaller towns that have economic potential or are situated along the economic corridors. In 2010, the Water Supply Law came into force with the aim of consolidating the numerous pieces of water supply legislation and strengthening the legal basis for the provision of sanitation services. More specifically, the law aims to clarify the water supply regulatory environment; create an enabling environment for private sector participation and stronger community management of water supply; clarify responsibilities and establish the right of access to basic water supply, sanitation and wastewater services; and ensure the future legislative support of customary tribal and ethnic law. The law confirmed that responsibility for piped public water supply schemes lies with PNPs, while Nam Saat is responsible for non-networked (rural) schemes. With emerging towns being identified as urban areas, there is a policy focus on providing piped water supply systems as opposed to other forms of water supply. This is to meet government targets of piped water supply to urban areas. Although the PNPs are responsible for water supply in urban areas, there is flexibility for management models and there are a number of PPP schemes currently operating as a result of this. The piped water systems in emerging towns are often simpler than those in the larger cities.

In 2012, Resolution 03 of the Politburo provided further guidance on implementation of the Sam Sang policy. The resolution is relevant to emerging towns in a section on developing villages as development units. It calls for attention to be paid to villages to ensure that they are suitable for the development of infrastructure and social, economic and cultural systems in order to maximise benefits. It also calls for clustering villages and clearly defining village clusters, with emphasis on those near borders and those which have sustainable development. These village clusters comprise many of what are now

defined as emerging towns. The resolution specifies that development targets must be identified at central, provincial and district levels. Politburo Resolution No 3 is extremely important as the catalyst for much of the work on emerging towns.

With the creation of the Department of Water Supply in MPWT at the beginning of 2016, there was a need to formulate an overarching policy covering water, sanitation and water resources. Accordingly, the responsible ministries (MPWT, MOH and the Ministry of Natural Resources and Environment (MONRE)) met to re-structure and clearly define the roles and responsibilities of the different agencies. This was seen as a promising move, since the ministries had acted independently of each other and the lack of coordination had been problematic in the past.

Sanitation overview | Up until 2015, there was an emphasis on coverage rates for access to improved sanitation facilities, in line with the MDG sanitation target. In recent years, integrated water supply and sanitation projects have become more common, and hence the profile of sanitation has been raised in project areas. However, the scale of most projects is limited, with a small number of villages being targeted as opposed to a district wide project. There are also marked inequities in the distribution of sanitation access.

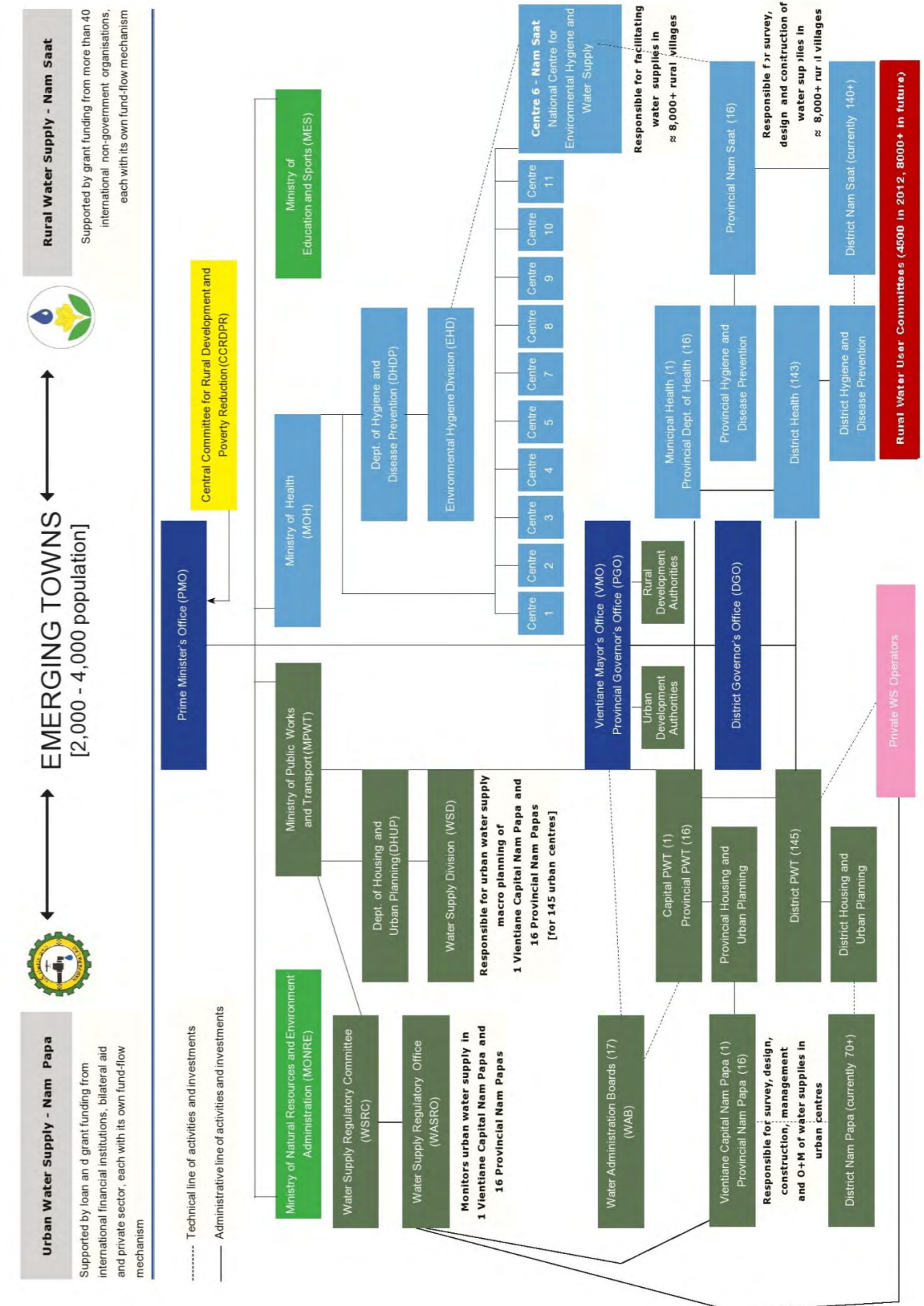
Despite the relatively high rate of access to improved sanitation facilities, there is still concern over the safety of sanitation. The most common type of sanitation facility in urban areas is a pour-flush toilet with an infiltration pit, or a septic tank. The facilities are built onsite, with the owner of the site responsible for sanitation and also drainage. A 1999 decree from the Prime Minister's office mandated the development of urban sanitation to MPWT. Responsibilities included a sector strategy, investment planning and technical regulations relating to urban wastewater and wastewater management. Little attention has been paid to the disposal of waste, and there is a lack of regulation and enforcement of safe disposal. A 2015 study (ESWRS/EDD/ESCAP, 2015) found no major urban sewerage systems or wastewater collection, treatment and disposal systems in Laos. Septic tanks are not regularly desludged, and sludge is commonly discharged untreated directly to public drains or to roads, paddy fields or wetlands.

Although there is an institutional requirement for Urban Development Administration Authorities (UDAA) to manage sewerage, drainage, solid waste and wastewater management systems, UDAA are either non-existent or insufficiently resourced in many urban areas. In the absence of a UDAA, OPWTs have often assumed responsibility for implementing sanitation regulations.

The policy framework for sanitation is not as clear as the water supply policy framework. There is neither a

sanitation law parallel to the 2009 Water Supply Law, nor a regulatory body for sanitation. An urban sanitation development strategy for the 2014–2030 period is strongly focused on decentralised wastewater treatment systems (DEWATS) as a key method for wastewater treatment in urban and peri-urban areas. DEWATS are seen as appropriate for small and emerging towns. Using low-cost technology, DEWATS are affordable, particularly since the topography in Laos is often conducive to a gravity system, and there is therefore no need for electric pumps. In emerging towns with a limited budget, the costs of a DEWATS can be covered by the local authority or a donor. A small number of decentralised wastewater treatment systems have been constructed in emerging towns. These have been typically implemented by external funding institutions in partnership with public and private sector stakeholders, and NGOs such as the Bremen Overseas Research and Development Association (BORDA) and Groupe de Recherches et d'Echanges Technologiques (GRET). A pro-poor focus is a key feature of existing DEWATS.

Figure 1: Institutional framework for water supply in Laos



Water supply and sanitation sector strategy for emerging towns

The process of developing the emerging town strategy

The idea for a specific strategy for emerging towns grew out of discussions between UN-Habitat and MPWT. DHUP's existing strategy was developed with ADB support and focussed on existing towns as opposed to emerging towns. At the same time, there was recognition of the potential of emerging towns for growth and the development of more urban characteristics, rendering them suitable for piped water systems. As developing urban areas, the emerging towns are subject to government targets for piped water supply in urban areas. This policy focus, which predates the emerging town strategy and is based on long term experience in Laos, was significant in the selection of piped water systems as the type of water supply in emerging towns. In addition, residents of small and emerging towns had clearly articulated their aspirations for piped water supply. An example from UN-Habitat staff is that of Sayabouly, where UN-Habitat had provided piped water supply to selected settlements. However, due to the cost constraints of expanding the water network, a neighbouring settlement was provided with several options of household water treatment. The residents were not happy with the options presented to them and continued to press for a piped water supply. The demand for piped water supply stems not only from the ease factor but also from the fact that it opens up opportunities for various economic activities. In several towns it has been observed that provision of piped water supply leads to the establishment of businesses such as ice factories, fuel stations and guest houses.

Although there was a recognised need for a road map to guide the development of water supply and sanitation in emerging towns, there was also an appreciation that the responsible agencies had limited resources and capacity. Accordingly, a decision was made to design an integrated project which would both develop a strategy and also provide tools to assist in the implementation of the strategy. The initial tool was the Lao National Water Treatment Plant Database, which is explained further on in this report. An emerging towns strategy and related water treatment plant database aligned with the aims of the GoAL WaSH programme was developed and an agreement was drawn up with the Stockholm International Water Institute (SIWI) for a second phase of the GoAL WaSH programme in Laos.

Once arrangements were in place, UN-Habitat employed consultants to prepare the strategy in consultation with

stakeholders, including DHUP, the PNP, UNICEF and WHO, other projects funded by ADB, and provincial authorities. The consultant had extensive knowledge of water supply and sanitation in emerging towns in Laos along with the associated policies and strategies. In addition to bilateral consultations, a national stakeholder inception workshop was held in May 2012, with DHUP and the water board as key participants. The workshop was chaired by the director general of DHUP and aimed to present the project, including the situation analysis, methodology, time-frame and terms of references for both the emerging town strategy and the WTP database, as well as gain feedback from participants. During the workshop the consultant gathered existing data and documents relevant to the proposed strategy. These included strategies, the water supply law, and data detailing the baseline status of water supply and sanitation in urban areas. Key points from the workshop included the naming of the emerging towns strategy in both Lao and English. The decision was made to prepare the strategy separately from the urban water supply strategy, which was prepared with assistance from ADB, on the understanding that the two strategies would be combined once they were completed for further submission to the Government for approval. The consultant team was requested to liaise with the consultants working on the ADB supported urban water supply strategy in order to ensure that the two strategies were compatible and that there were no duplications or omissions. During the workshop it was decided that emerging towns should be identified with reference to MOHA's work on emerging towns, and it was specified that gender issues should be included in the strategy. In these initial stages of the strategy preparation, consultations were held to clarify the definition of emerging towns so that it accurately described the many emerging towns that experienced rapid growth and had the potential to develop into significant urban areas.

With all the relevant data in hand, a consultant drafted the strategy. Three months was allocated for the task of drafting. DHUP established a committee with the specific purpose of working on the strategy during this time. The lead role on the committee was assigned to a highly experienced member of DHUP who had extensive experience in working with all stakeholders, including donors such as ADB. The committee worked closely with the consultant and with the Water Supply Division of DHUP. Their role was to guide the consultant in drafting the strategy, provide feedback and ensure the relevance of the strategy.

Once the draft strategy was completed it was reviewed by UN-Habitat and SIWI before being shared with MPWT. After review by the key partners, a second stakeholder meeting was held. This second stakeholder meeting had more participants than the first, and was attended by stakeholders from all three regions of Laos – northern, central and southern. The participants included representatives from Public Works and Transport, PNP, NGOs, international financial institutions and UN agencies. The purpose of the meeting was to disseminate the strategy and get feedback on it. There was consensus among participants for the need to strategize about water supply and sanitation for emerging towns. This was based on the widespread observation that many communities were urbanising. The need for investment was identified as a major issue and discussion was held on the potential roles that the private sector can play, on ways of attracting donors, and of the allocation of responsibilities among Government agencies. There were no major issues raised with the draft strategy and there was agreement on its content.

The strategy was accepted by MPWT in 2012. In 2016, with the new Department of Water Supply and preparation of an overarching water supply policy, it was suggested that all water and sanitation strategies should be revisited with stakeholder consultation. The DWS has a wider mandate than that of the former Water Supply Division and there is a desire to develop a coherent strategy to guide the department's work. A possible format for a more comprehensive strategy is to have a section for water and a section for sanitation in the same strategy.

Description of the emerging towns strategy | The emerging town strategy is closely aligned with Government policies. Emerging towns generally grow from village level and then, under the Sam Sang policy, villages are clustered together in order to create a development unit. The emerging town strategy for water and sanitation enables one of the next steps in the development of these settlements. According to local authorities, a piped water supply system and improved sanitation typically attract more migrants, leading to further population growth. The water supply also promotes the establishment of businesses, resulting in economic growth and contributing to the ongoing development of the town.

The emerging town strategy consists of a preamble followed by two sections. The preamble was prepared by DHUP. It explains key political and developmental goals for Laos such as poverty reduction and water supply coverage targets. It then informs that

...the Water Supply and Sanitation Strategic Plan for emerging towns has been designed to be read as a

stand-alone document and prepared so that key points can be integrated into the main Sector Strategy document that has been substantially completed by the Department of Housing and Urban Planning. Resolution 3 of the Politburo (Feb 2012) provides the rationale for including emerging towns (village clusters) in the Water and Sanitation Sector Strategy. The objective of Resolution 3 is to "build provinces as strategic units, districts as comprehensively strengthened units and villages as development units."²

Section 1: General situation of the water supply and sanitation sector

The first section of the strategy contains background information on the water supply and sanitation sector in Laos. It begins with an explanation of the development of the sector from the 1960s to the present day. This is followed by descriptions of the policy, legal and institutional frameworks as they relate to water supply and sanitation. The section then looks at the forms of urban settlement in Laos, with a particular focus on emerging towns and the challenges in realising decentralisation aims and state-owned enterprise reform. The remainder of the section deals with water supply and sanitation services in emerging towns, beginning with a detailed list of issues. The issues relate to sector co-ordination, a shortage of trained staff, the regulation of water supply operations, water tariff policy, and MPWT's role in supporting a "bottom-up" decision-making process. Key constraints and problems are then identified as insufficient funds to expand coverage and improve service levels; weak sector planning and implementation capacity at the regional and local levels; absence of an "enhanced environment" due to an inadequate institutional and legal framework; and limited project implementation modality. With regard to project implementation modality, the project management unit (PMU) of DHUP, while operating efficiently, has an absorptive capacity of approximately USD 4–5 million per year. This is far less than the USD 25–30 million required to meet government targets, and hence there is a need for other implementation modalities which align with decentralisation directives.

The final part of the first section explains the Sector Investment Plan (SIP). The required investment to 2020 for the rehabilitation, expansion, or development of water supply systems in urban centres, including emerging towns, is estimated at USD 210 million. This includes USD 91 million for water supply in four categories of small towns. Of the USD 91 million, USD 60 million is expected from known sources, while the source of the remaining estimated USD 30 million is unknown. The SIP prioritises Vientiane Capital, followed by provincial capital towns, about 40 small towns³ with a population of over 3,000 and a population density of more than 30

² Water Supply & Sanitation Sector Strategy for Emerging Towns, p. ii.

³ The term "small towns" is taken from the SIP. Many of these towns with a population of less than 4,000 would now be classified as emerging towns.

persons per hectare, and 30 small towns with a population of 2,000 or less. In addition to the SIP, DHUP has used a decision matrix to prepare a schedule of towns classified as Priority 1 or Priority 2. Priority 1 towns have a larger population and Priority 2 towns have a population of about 2,000. DHUP will need to consult with MOHA and provincial and district authorities to agree on a matrix-based selection process to ascertain whether the Priority 2 towns include key centres that meet the criteria outlined under Politburo Resolution No 3.

Section 2. Water Supply and Sanitation Sector Strategy (2013–2020)

The introduction to Section 2 of the strategy explains the link between the Water Supply and Sanitation (Urban) Sector Strategy and the emerging town strategy. DHUP had identified 10 goals in the Water Supply and Sanitation (Urban) Sector Strategy, most of which also apply to emerging towns. The emerging towns' strategy contains a further 3 goals which are specific to emerging towns. Together, the goals aim to meet the intent of Politburo Resolution No 3. Section 2 of the emerging town strategy then lays out the vision as being "Safe, reliable and accessible water supply and sanitation for all". The documents on which the strategy is based are then identified, followed by sector performance targets for 2015, 2020 and 2030. The targets for access to safe water by the urban population are 67 percent for 2015, 80 percent for 2020, and 90 percent for 2030. The vision statement, background documents and performance targets were prepared by DHUP.

Performance targets to 2020

Specific objectives

The following ten goals were prepared by DHUP:

- Review institutional framework, policy enforcement and regulations on water supply and sanitation works.
- Improve sector institution and management.
- Improve the efficiency of water supply business regulatory system.
- Develop water supply and sanitation in conjunction with urban development.
- Expand water supply and sanitation services to small towns in rural areas.
- Improve capacity for water supply enterprises by enhancing customer satisfaction, and providing efficient and sustainable services.
- Promote and increase the ratio of private sector involvement in the development and provision of water supply and sanitation services.
- Improve the qualification and numbers of professional staff in line with sector needs.
- Ensure a gender balance for the water supply and sanitation sector.
- Promote the development and use of appropriate technologies and techniques.

The three emerging town goals are summarised below:

1) Legislation and policy reform as applied to emerging towns, including:

- i) Transfer of responsibilities in water supply and sanitation to local authorities;
- ii) Integrated policies for water supply and sanitation;
- iii) Ensuring access to water supply and sanitation by identified vulnerable and marginalised groups;
- iv) The empowerment of local authorities to organise the planning and provision of water supply and sanitation services in consultation with all relevant stakeholders;
- v) Informing stakeholders about national policies and international norms, standards and conventions, and making information publicly available; and
- vi) Surveying informal and low-income settlements to identify potential beneficiaries of pro-poor policies.

2) Capacity building as applied to emerging towns, including:

- i) Needs assessments to ensure local authorities have adequate staffing with appropriate technical expertise;
- ii) Costed training plans for central, provincial and district levels; and
- iii) Adequate training opportunities, support for remuneration plans, and career opportunities for local government employees.

3) Monitoring of performance of the emerging towns sector performance, including:

- i) Establishing indicators;
- ii) An accountability framework for basic services delivery, including an effective regulatory system and penalties for non-compliance by service providers;
- iii) Monitoring the management performance of service providers and local authorities as a basis for technical assistance, capacity building or corrective action; and
- iv) The development of an anti-corruption legal framework, along with strict action on corruption cases.

Executive agencies and actions for implementation
Explanations are given of the roles of MPWT, local authorities and other line ministries. Actions for implementing the sector strategy are the following:

- a. Mobilisation and allocation of funds to priority projects;
- b. Promotion of participation by all sectors of economy and the people;
- c. Management and capacity building;
- d. Supervision, monitoring, evaluation and reporting.

Impact of the strategy | The emerging town strategy has raised the profile of emerging towns in the water and sanitation sector in Laos and has led to greater acknowledgement and deeper understanding of the associated issues. The strategy has been included in the small towns strategy and has been endorsed by the Government. It is therefore included in the Government policy structure, thereby ensuring a focus on emerging towns in the future policy framework for water supply and sanitation in Laos. This is important in the context of the 2016 institutional changes and associated strategic planning, including the review of existing strategies and the development of an overarching policy for water and sanitation. The major focus of the water and sanitation sector for 2016 is the transition to the new structure resulting from the creation of the DWS. The major workload in transferring responsibilities from DHUP to DWS has delayed other priorities, including further steps in implementing the emerging town strategy. It is expected that concrete results will be seen as a result of the strategy once the shift to DWS is complete and the policy framework has been streamlined under the overarching policy.

In terms of investment, the strategy has supported MPWT's lobbying for investments from donors for emerging towns. In the past, when donors approached MPWT, discussion would centre on towns down to the level of small towns, but the strategy has brought a focus on emerging towns into the discussion. It is not only MPWT but, in line with the devolution of responsibilities to the local level, local government authorities that are also now looking at emerging towns. The focus on emerging towns has seen their inclusion in the sector investment plan, which is an essential step in seeing their needs for water and sanitation services met.⁴

The increased attention on emerging towns is reflected in a number of new water supply systems. For example, UN-Habitat partnered with the International Fund for Agricultural Development (IFAD) in a project in the south of Laos. As part of a broader IFAD project, UN-Habitat implemented a water supply and sanitation project through the community-based model which had been introduced and refined through MEK-WATSAN. In the IFAD project, UN-Habitat worked in the districts of Phouvong and Sanxay, in Attapeu Province. There were two target villages in Sanxay District with populations in 2012-2013 of 1,203 and 1,190. In the past,

these villages were classified as rural and therefore ineligible for a piped water supply. With a population density of more than 30 persons per hectare and the potential to develop into urban areas, the clusters of which the villages are a part exhibit the characteristics of emerging towns. UN-Habitat implemented the project according to the emerging town strategy, and as a result these villages are now serviced by a piped water system.

Another development agency which is active in providing water supply services to emerging towns is the French NGO Groupe de Recherches et d'Echanges Technologiques (GRET). Pilot projects implemented by GRET had demonstrated that public-private partnerships (PPPs) are an effective model for managing water supply services in small and emerging towns in Laos. Working in the provinces of Vientiane, Bolikhamxay and Sayabouly, GRET has implemented an additional eleven water supply services since 2014. These services are all operating on a PPP model. A recent example is the drinking water supply service which has been operating since April 2016 in Pakfang, a town of 3,200 inhabitants in Vientiane province. Previously, Pakfang's water supply consisted of water from the Mekong River that was delivered by tankers and was 20 to 30 times the cost of the water now supplied through the GRET project. A technological innovation in Pakfang which is suitable for water supply systems in emerging towns is the use of photovoltaic energy to partially power the system. The GRET country representative in Laos gives the emerging towns strategy much of the credit for the creation of an enabling environment for water supply systems in emerging towns.

The attainment of water coverage goals is a long-term process, yet it can be seen that the emerging town strategy has had an impact despite the relatively short time since it was adopted. A key outcome is the increased recognition of and interest in engaging in small communities which had previously fallen through the gap in service provision. This raised the level of understanding and will continue to influence investment and methods of service supply in the future.

⁴ Further explanation of the SIP can be found in Section 1.8 of the Emerging Towns' Strategy, described on page 28.

Lao national water treatment plant database

Origin of the idea | The key motivation for the Water Treatment Plant (WTP) database was to provide a tool to help enable the implementation of the emerging town strategy. Water supply systems in Laos are mainly funded by development partners. The major donor for large systems is ADB, while UN-Habitat has been working in small towns and peri-urban areas, and a range of agencies have specialised in rural areas. The cost of designing a WTP is substantial, due in part to the need to employ international consultants to develop the design. The designs vary in complexity, with emerging towns generally requiring simpler designs than large urban centres. Despite the simpler design, there have still been large amounts spent on consulting services. The idea of a database of WTP designs came from observations by UN-Habitat that there was already a great deal of experience and data in the country. However, the data was scattered throughout offices the length and breadth of the country. Since much of it was only available in hard copy, it was not easily accessible as a resource.

Making this data available to water utilities with plans to construct a WTP would assist them in selecting an appropriate design. This would build capacity in the water utilities and other local sector stakeholders, and considerably lower the cost of a new water supply system, allowing available funding to be spread over a greater number of towns. The idea was to provide an online database that would be accessible to all relevant stakeholders. A common scenario is that the Government approaches a potential donor with a request to fund the water supply system in a particular town. However, the request is not backed up by suggestions for the needed technical designs. With a database of WTP designs, Lao technical staff could research the technical designs and specifications of existing WTPs and select an appropriate design based on the parameters of the town for which a WTP was planned. This would eliminate the need to employ the services of an international consultant. The concept of the database aligned with the GoAL WaSH, and so the idea became part of the continuing partnership between SIWI and UN-Habitat.

The process of developing the database | UN-Habitat staff had the vision of how a WTP database would work and they guided the team that developed it. A description of the database is provided in Annex 3. The database was developed ultimately for use by DHUP, and regular consultations were held throughout the development

process to ensure that it met their needs. The main aim was to provide relevant tools to assist in designing WTPs. A small number of people were involved in the consultant team that developed the database during September 2012 to June 2013. An international consultant was employed to elaborate on the UN-Habitat vision and to clarify details of the database. The consultant had extensive experience in water supply in Laos, and had worked on the Northern and Central Water Supply & Sanitation Project, and the Small Towns Water Supply and Sanitation Project as an international water supply specialist and design manager. He was therefore familiar with many water supply projects in Laos. A national information technology (IT) consultant was engaged to construct the database and lastly, an IT company by the name of Digital Divide Data (DDD) was contracted to operate and maintain the database website.

There were three main work stages in the development of the database. These included:

- Development and construction of the database structure;
- Collection of all available data from a range of relevant agencies; and
- Conversion of the collected data into a format which was compatible with entry into the database.

Prior to constructing the database, the consultant team was required to refine the conceptual details and content of the database. Initially, an outline database framework was established. This involved identifying key fields from the wealth of available data. In addition to the key fields, there were a large number of secondary fields. The consultant team selected which of these secondary fields to include and there was consultation to find a consensus on these.

At the same time as the content of the database was being finalised, the team was meeting with agencies which had been involved in water supply projects and which potentially possessed relevant data for the database. The first round of WTPs had been identified from UN-Habitat projects and from the consultants' experience. The meetings with other agencies aimed to identify further WTP designs, with a target number of 40 to eventually be included in the database. Meetings were held with MPWT, MOH, the Water and Sanitation Program (WSP), UNICEF, ADB, WHO and GRET. Some of the meetings did not result in the identification of a relevant

WTP design but the team gained a lot of information from the ADB Project Office for the Small Towns Water and Sanitation Sector Project (STWSP), the ADB Project Office for the Northern & Central Water and Sanitation Sector Project (NCRWSSP), the GRET office and Nampapa Nakhone Luang (the Vientiane water utility). The projects were for different scales and covered secondary, small and emerging towns with populations ranging from 6,151 to 24,000.

A time-consuming component of the project was the conversion of data into the required format for the database. Drawings were added to the database in pdf format. This required the conversion of hundreds of drawings to pdf format which was a major task.

Once the data had been collected and the content for the database had been finalised, the database design was formulated. A workshop was held on 30 November 2012, at which time the draft database structure was presented to DHUP for their constructive feedback. With the agreement of all parties on the design, the IT consultant constructed the database and linked it to a website. The database construction was carried out in consultation with the WTP engineer to ensure that the fields captured relevant and concise information. The website became operational in 2013, and the initial contract saw it maintained until 2016.

The database was the first of its kind to be developed in the Lao water sector, and stakeholders were initially unfamiliar with its structure and use. In order to introduce the water utilities to the database and to train staff in its use, a manual was developed. This was presented at a workshop held following the completion of the database website. The workshop was held in Vientiane and was attended by representatives of all PNPs as well as the Vientiane water utility. The way forward for emerging towns was highlighted at the same workshop through the presentation by MPWT of the draft emerging town strategy. Recognising that users would require ongoing assistance with using the database, DDD's contract was inclusive of support services as shown in Table 3.

Table 3: Support services for database use

Service	Duration of assistance
Half day refresher/ training courses	3,6,9 and 12 months after hand-over
On call information backup and maintenance	Up to 3 years from handover
Maintenance of website	Up to 3 years from handover

After nearly three years of operation, additions were made to the database in 2016, under Phase II of the Lao GoAL WaSH programme. Under this second phase, the WTP database was transferred to the new Department of

Water Supply. Following discussions between SIWI and UN-Habitat, the following improvements were made to the database:

- The system was translated into the Lao language.
- A digital visitor counter was added.
- A list of water governance documents was added, including maps, strategies and key performance indicators (KPIs).
- User manuals for the database were developed in Lao and in English.

To assist with use of the modified database, a half-day introduction and training was held on 17 May 2016. In addition to UN-Habitat staff, the training was attended by the deputy director of the Department of Water Supply, and staff from four water utilities. This training was an update on the original training attended by staff from all water utilities in 2013.

Ownership, management and use of the database

The database was created in order to assist the work of DHUP/DWS, but it is intended to be an open resource accessible to all interested parties. However, the administrative privileges lay with DHUP, which was to be the only party able to amend the database. The website was maintained by DDD until June 2016. The original plan was that DHUP would then take over all responsibilities for the database maintenance including payment for the domain name and hosting of the website. Costs were estimated in 2013 to be approximately USD 50 per year, with the possibility of renewing the contract with DDD. In 2016, the domain and web hosting was extended to 13 March 2019, under Phase II of the Lao GoAL WaSH programme.

The database is a means by which any PNP manager is able to research WTP design samples from existing treatment plants constructed with the assistance of ADB, UN-Habitat or GRET. There is a wide range of population sizes, plant capacities, and costs in the designs held in the database. This increases the likelihood of PNPs finding a design which is appropriate for their context. Previously, PNP managers lacked resources for the design process and, as a consequence, they had had to engage consultants. With the database, the existing designs provide a template which can be modified, thereby removing the need to employ a consultant and, at the same time, building capacity within the PNP staff. Feedback from the PNPs indicates that the database is having the desired results. PNP directors have commented on the usefulness of the database in planning, managing and monitoring water supply systems. The diversity of WTP designs and the amount of detail provided has been appreciated and has enabled PNP staff to find appropriate WTP designs without external assistance, saving them time and money. Designs for smaller WTPs are particularly useful, since there is now a focus on small and emerging towns. The amendments made to the database in 2016 have made a huge difference to its accessibility by PNP staff mem-

bers. In particular, the translation into the Lao language means that more staff can use the database as the majority of staff have very limited English language skills. The database is now very easy to use and PNP directors have commented on the richness of data in the water governance section. They feel that the KPIs give good guidance and appreciate the map on the status of urban water supply services in Laos. The map is up to date and in the Lao language. PNP staff feel that the database is a good source of learning and they have gained new ideas from it.

There is limited Internet access and IT equipment in Lao government offices. To equip DHUP with the necessities

to use the database, the GoAL WaSH project provided two laptop computers. There was a need, however, for further promotion and awareness-raising about the database and its benefits. The 2016 training has helped meet this need. To date, the database has perhaps been more widely used by PNP managers than by the central level. The managing director of the Attapeu PNP shared that they had regularly used the database to explore documents from projects which had similarities to their own water supply projects in Sanxay and Phouvong districts.

Discussion

There were a number of prerequisites in place in Laos that allowed the emerging towns strategy to succeed. The first key factor is that the problem was clearly recognised. The issue of a gap in services for settlements at the level of small towns, village clusters or large villages, had been identified long before the formal categorisation of emerging towns. The 2002 small town study raised fundamental questions about the most suitable management models for small towns, the most appropriate agency to take responsibility, and the ability of systems to grow and adapt to changing needs. As international awareness grew of the gap in water and sanitation service provision for small towns, the phenomenon was observed in Laos by the central Government as well as international organisations and local level authorities. The large number of settlements without access to safe water and sanitation was seen as an obstacle to the achievement of Laos' development goals.

Once the problem of a lack of service provision was recognised, the Government developed a definition of emerging towns to fit the Lao context. While small towns in many countries have populations of 50,000 or up to 200,000 in some cases, settlements in Laos are much smaller. With major ADB water and sanitation projects concentrating on small towns with populations of 4,000 to 20,000, the problem lay with emerging towns with a population of fewer than 4,000. Previously, urban and rural areas were defined administratively rather than by size or density of population. By 2010, the Government had redefined "urban" areas as those with at least 2,000 inhabitants, and with a population density of more than 30 persons per hectare. All settlements with less than 2,000 people are considered rural. More recently, in order to facilitate the development of emerging towns, the Ministry of Home Affairs (MOHA) has been identifying emerging towns. MPWT has added further details to the Government definition to develop criteria for emerging towns for use in the water and sanitation sector. The precise definition of the target towns was necessary in order to give the emerging towns strategy a clear focus. The Government's policy framework enabled the development of the emerging town strategy. The strategy was written in consultation with a committee comprising MPWT officials. Resources are allocated from the central level to the provinces, and so it is necessary for central Government to support the strategy with funding when it becomes available.

The role that a number of development partners have played in the development of emerging towns has been crucial to the success of the emerging town strategy. Each agency has played a niche role in the overall strategy development for emerging towns. As the funder of major projects in the larger towns, down to those with a population of 4,000, ADB has drawn a clear distinction between those towns which are eligible for its significant assistance, and those which do not qualify. Through its experience in implementing projects in smaller towns, UN-Habitat has gained institutional knowledge of the issues related to water and sanitation in emerging towns, including technical solutions, the institutional setup, financial mechanisms and community participation. The French NGO Groupe de Recherches et d'Echanges Technologiques (GRET) has implemented projects in emerging towns under the PPP model, and the Neighbouring Countries Economic Development Cooperation Agency (NEDA) has assisted in five districts.

The central Government has coordinated the contributions made by the different agencies. Over the years, the development partners have developed fields of specialisation and a knowledge of the context in Laos. Several individuals from various agencies have been involved with the sector for a number of years and this has aided the building of a degree of trust and cooperation between agencies, as well as a shared understanding of the issues faced by emerging towns and the potential solutions. Other key partners in developing water supply and sanitation in emerging towns are the local authorities, in keeping with the Sam Sang policy. The central Government is the pivotal coordinator between development partners and the local authorities. The manner of coordination in Laos reflects the political system, which is based on a centrist government.

Emerging towns are being brought into the framework for urban water supply and sanitation. The responsible Ministry is MPWT, as opposed to MOH. Prior to the emerging towns strategy, a Water Supply and Sanitation (Urban) Sector Strategy was prepared by DHUP with the assistance of ADB. There are 10 goals identified in the strategy, of which the majority are applicable to emerging towns. Based on the assumption that the Urban Water Supply Strategy is inclusive of emerging towns, the specific objectives identified by DHUP are applicable to emerging towns. The structure of the Urban Water



Photo: UN-Habitat

Water treatment plant (2,400m³/day) in Vilabouly town, Savannakhet province.

Supply Strategy is such that additional goals which are unique to emerging towns can be integrated into it. The emerging town goals are able to be seamlessly integrated into the prior draft strategy document so that the intent of Politburo Resolution No 3 is met. This was ensured through consultations between the consultant team and the consultants engaged by ADB to prepare the Urban Water Supply Strategy. The consultations aimed to ensure compatibility between the two documents and to avoid duplication or the omission of important points. With the preparation of an overarching water supply policy in 2016, the strategies will again come under review, and the manner of integration may be amended to align with new developments.

Although water supply is increasing in emerging towns in Laos, the process is not without challenges at the policy and management levels. A major challenge is that of knowledge management. Many documents in Laos are in hard copy form only and thus are not easily accessible. In the water sector there is data relating to numerous topics including marketing, economic information, technical information and business management. There are diverse understandings and a lot of information originating from many different sources. There is a multitude of policies and strategies of which there is little awareness, and it is difficult to find out what documents are in existence. Even key people in central government positions have difficulty in finding information and answers to queries. While the emerging towns' strategy is known to key people, there are other stakeholders who would benefit from consulting it, but who have difficulty in accessing it. Although it was adopted by MPWT in 2014, there is still a need to raise awareness of the strategy among relevant stakeholders in the water sector. The emerging town strategy originated from discussions between MPWT and UN-Habitat. In contrast, the vision for the WTP database came from UN-Habitat. Although the benefits of the database are plain to see, there are many other donors with good ideas. This proliferation of donor-driven ideas has resulted in different PNPs receiving different forms of assistance, depending on which projects are implemented in their province. With limited resources and budget, it is difficult to roll out ideas across the entire country. The PNPs, which have perhaps used the database the most, have done so under the guidance of and with the encouragement of UN-Habitat staff. In particular, the country technical advisor for UN-Habitat has acted as a champion for the database. It appears necessary for an individual to champion the cause of an innovation in order for it to become established independently of the project which created it. Many people in Laos do not have well developed IT skills, and many workplaces have limited IT equipment and Internet access. Because of this, there is not a lot of confidence in using new IT tools and a lot of support is required.

The water sector in Laos is continually developing and there are plans to improve coordination in the sector. To aid coordination between different entities, an overarching water and sanitation policy is under development. In line with this new policy, there are plans to revisit existing strategies, including the emerging town strategy, with the aim of drawing the strategies together. In this process, it is likely that the emerging town strategy will be combined as part of a more inclusive strategy.

The need for a reliable information management system is on the agenda with the DWS so that data is retained, and is accessible to all stakeholders who need it. In the past, DHUP did not always have personnel to work as a counterpart to consultants and, as a result, some information was lost when a consultant's contract ended. The development of an information management system, along with the associated capacity building should have a major impact on the sector.

Regarding the WTP database, there are ideas to expand it further. The initial idea was that it should provide purely technical assistance with the design of water treatment plants. However, current thinking sees the database used in a broader sense than was originally envisaged, and it is becoming a central repository for a wider range of data. Already, the emerging town strategy, a number of geographic information system (GIS) maps and a list of national key performance indicators (KPIs) for water supply have been added to the database through Phase II of the GoAL WaSH programme. There is potential for additional data to be added. One area which needs strengthening is the provision of means of verification. The database has the potential to hold means of verification such as MPWT or provincial level annual reports. As it is used more often, there will be more data which can be added to it to increase its value as a governance tool. In order for the database to become more widely used it will need further promotion among PNPs. This may occur in a further phase of the GoAL WaSH programme, or through strengthened information sharing systems once the new DWS is more firmly established.

Conclusions

Laos has made considerable progress in the provision of water supply systems in emerging towns. Over the last decade and a half, the pace of development has increased in the water sector. The learning that has taken place has resulted in more efficiency in the use of resources, and a greater focus on sustainability. The former focus on hardware has broadened with the growing awareness of the importance of software activities. The emerging towns strategy is a result of decisions that have been made based on many years of experience in the local context. A key decision relates to the appropriate water supply designs and management arrangements for emerging towns. In Laos, the PNPs are responsible for managing all piped systems and these are now being constructed in emerging towns as well as in larger urban areas. Fundamental decisions such as these have led to a clarity of vision with regard to water supply in emerging towns. The production of the emerging town strategy has furthered the actualisation of the vision and will give guidance to the implementation of water supply systems. In the short time since the strategy was completed, there have already been piped water supply systems established in a number of emerging towns. This was possible through the direction given by the strategy.

The successful development and use of the database is one software tool that can contribute to the efficiency of establishing new water supply systems in different types of towns, including emerging towns. Almost four years after its completion, the online database is operating efficiently and has been used to research WTP designs for use in projects in emerging towns. Although there is a lot of technical information on the Internet from different sources around the world, much of it is inaccessible to Lao stakeholders due to language barriers. Many people working in the Lao water sector do not speak English, and the fact that the database is now in both Lao and English means that it can be used by Lao and international stakeholders.

A fundamental need in the ongoing development of the water and sanitation sector is an effective information management system. This is particularly true in the current situation where the majority of data is not digitalised and there are often no records showing the location of hard copy documents. In this context, ongoing awareness raising is needed to inform local level authorities and PNPs about both the emerging town strategy and the WTP database.

There is a long process of approval for policy and strategy documents in Laos. At the time the emerging towns strategy was written, the Water Supply and Sanitation (Urban) Sector Strategy was being internally reviewed by DHUP before being submitted to the Government. The emerging town strategy underwent the same process. With the formation of the DWS, there are plans to streamline the policy framework for water and sanitation, and the emerging town strategy will very likely be combined with other strategies. One strategy document which covers water and sanitation in all settings will be easier to promote to PNPs and authorities at all levels. However, the DWS has a very full work plan and it will take time to build up the new department, so in the meantime the existing strategies will stand.

The role played by Government was pivotal in the emerging town strategy. The development of a specific definition of emerging towns, the clarity of vision regarding technical and management concerns, and the continuing policy work are all key factors in providing water and sanitation services to emerging towns.

The development of the emerging town strategy and the WTP database exemplifies the value of strong partnership between the Government and development partners. The lack of water supply and sanitation services in emerging towns was recognised by both the Government and by UN-Habitat. The idea of an emerging town strategy came from DHUP, while UN-Habitat's prior work in Lao emerging towns and SIWT's focus on water governance contributed to the synergy of the collaboration.

Laos is not alone in having limited resources and capacity with which to achieve its development goals. It is therefore of crucial importance that resources are used efficiently in order to obtain maximum benefits. With a large and increasing portion of the population living in emerging towns, the way in which emerging towns has been put on the political agenda will have a significant impact. As capacity increases in the water and sanitation sector, the value of the strategies and tools in existence will be realised more fully.

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Annex 1: List of Lao documents reviewed

GoAL WaSH project outputs

1. Water Supply & Sanitation Sector Strategy for Emerging Towns.
2. Lao National Water Treatment Plant database.
3. Report on Preliminary Desk Review.
4. Report on Chronology of Policy Reform and External Assistance to the Water Supply Sector.
5. Report on Roles and Responsibilities of the Key Water Supply Actors.
6. Report on institutional options.
7. Report on Review and Proposal of Water Supply Management Models for Big Villages and Emerging Towns.
8. Lao National Water Treatment Plant Database Users' Manual.
9. Report on Summary of Outputs for Phase 1 of Project.

Lao Government documents

1. Politburo Resolution No 03: Formulation of Provinces as Strategic Units, Districts as Comprehensively Strong Units and Villages as Development Units.
2. Rural Water Supply in the Lao PDR, presentation.
3. Small Towns Water Supply and Sanitation Initiative in Lao PDR: A comparative study of small town water and sanitation services in developing countries, WASA/ DHUP/ Urban Research Institute, 2002.

Documents produced by development partners

1. Research on Innovative Policies, Practices and Approaches for Improved Sanitation in Laos, Desk Study Report for SNV Laos, March 2009.
2. Sam Sang in practice: early lessons from pilot implementation, AusAid/Adam Smith International, December 2015.
3. Lao People's Democratic Republic: Second Greater Mekong Subregion Corridor Towns Development Project, Project Data Sheet, ADB.
4. Lao People's Democratic Republic Water Supply and Sanitation Sector Review, World Bank/AusAid, 2010.
5. Urban Water Sector Regulation in Lao P.D.R: Reform, Key Measures, Successes and Challenges, UNCTAD, 2010.
6. Sector Assessment (Summary): Water Supply and Urban Development, ADB, 2012.
7. Lao People's Democratic Republic Urban Development Sector Assessment, Strategy, and Road Map, ADB, 2012.
8. Water Supply and Sanitation in Lao PDR: Turning Finance into Services for the Future, WSP, 2015.

Annex 2:

List of persons interviewed

Mr. Avi Sarkar

Regional Advisor, South-East Asia
Urban Basic Services Branch, UN-Habitat

Mr. Buahom Sengkhamyong

Chief Technical Advisor – Laos
Urban Basic Services Branch, UN-Habitat

Mr. Khamthavy Thayphachanh

Director General, DHUP, Laos

Mr. Phomma Veoravanh

Director General, DWS, Laos

Mr. Noupheuk Virabouth

Deputy Director General, DHUP, Laos

Mr. Somsanith Thiphasouda

Deputy Director of NPSE-Luang Prabang

Mr. Laksana Keosengthip

Deputy Director of NPSE-Khammouane

Mr. Vilaykhone Phimmasone

Managing Director of NPSE-Bolikhamxay

Mr. Bounleua Siliphanh

Managing Director of NPSE-Sekong

Mr. Khammani Laokham

Managing Director of NPSE-Saravane

Mr. Keovixien Sixanon

Managing Director of NPSE-Attapeu

Mr. Arnaud Vontobel

Country Representative, GRET

Annex 3:

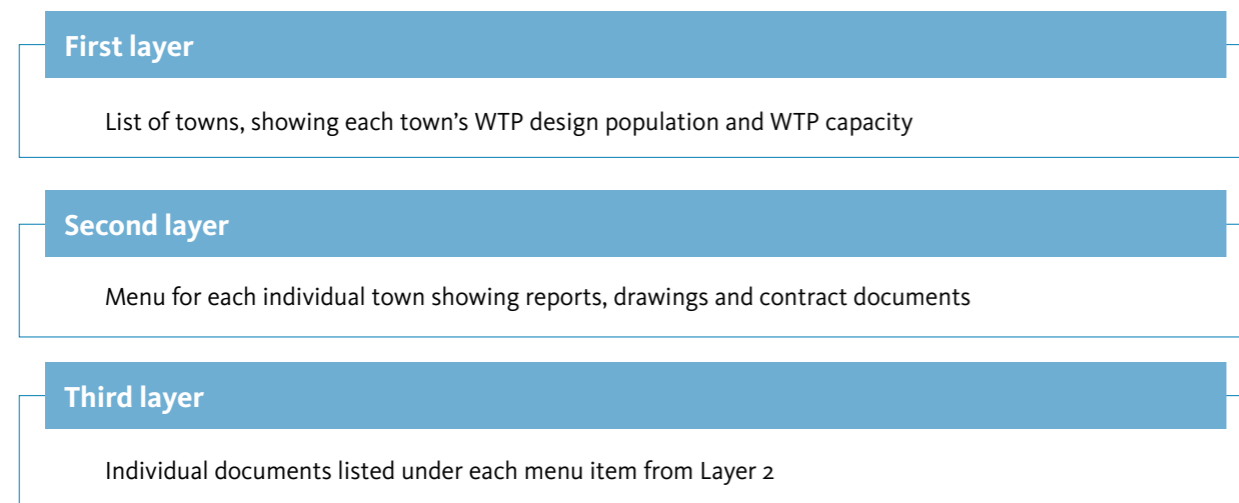
Key guiding questions for interviews

1. Where did the concept of emerging towns come from?
How widely used is the concept in Laos?
2. Where did the idea for the emerging towns' strategy come from?
3. What was the process of developing the strategy?
4. How does the ET strategy relate to other policies, strategies and guidelines, including Sam sang and the Guidelines on Decentralisation of basic services?
5. How has the ET strategy been promoted?
6. Where did the idea for the database come from?
7. Who have been the main users of both the strategy and the database?
8. What are the key factors that have contributed to the successful promotion of emerging towns on the political agenda?
9. What considerations were taken into account in the development of the strategy?
10. Describe the process of developing the database.
11. What government institutions were consulted or involved?
12. To your knowledge, who has used the strategy or database?
13. Has your organisation benefited from the emerging towns strategy/database? If so, how has it benefited?
14. What do you think

Annex 4: Description of the Lao national water treatment plant database

The database attained its target and currently holds data on 40 different WTPs. It is structured with three main layers as shown in Figure 3.

Figure 3: Structure of database



There are three different user groups which each have different access privileges on the website as shown in Table 4.

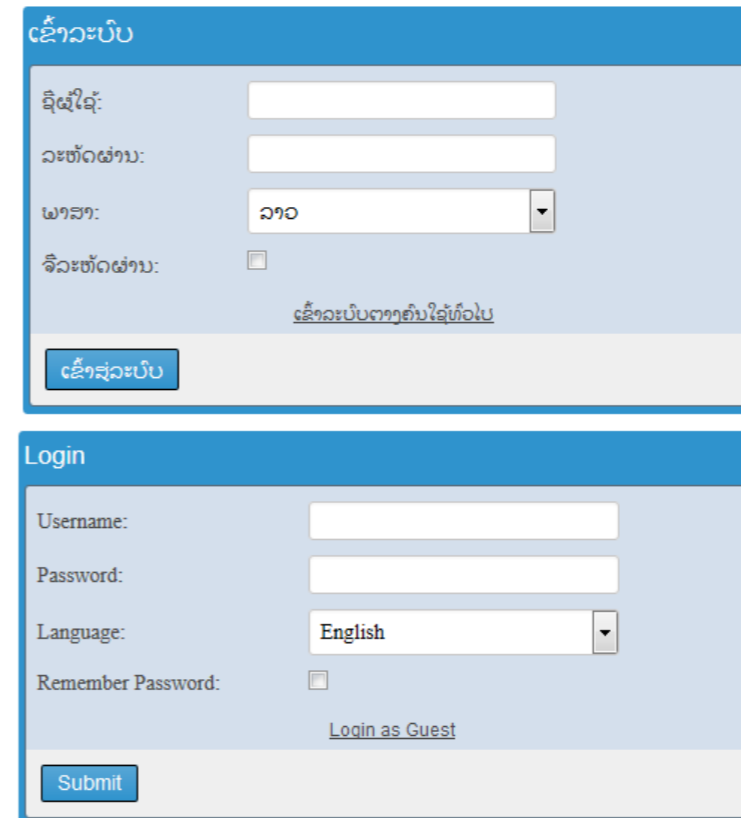
Table 4: Permissions for user groups

	User groups		
	Guest	Data entry	Admin
Username and password required	X	✓	✓
View data	✓	✓	✓
Export data	✓	✓	✓
Edit data	X	✓	✓
Add data	X	✓	✓
Delete data	X	✓	✓
Manage titles of drawing types	X	X	✓
Manage users and permissions	X	X	✓

The first page of the website contains details for logging in, and there is now also a language option where users can select either English or Lao. Figure 4 shows both the Lao version and the English version of the login page. There is an option to change the language on pages in the first layer of the database. Once a user has logged on, they will be taken to the first layer of the database which shows the list of WTPs. Figure 5 shows the first layer

as viewed by a guest user. The first page shows only the name of the WTP, the design population and the plant capacity. To view all the fields for the WTPs, the user must click on “Reporting WTP”, which is located on the panel to the left of the WTP list. The remaining fields are the source type, year of commission, total cost and cost per capita.

Figure 4: Login page in both Lao and English



The user is able to select a WTP, and there are two options to view all the data associated with the selected WTP including attached files. Figure 6 shows the data held for the Donthalat WTP. The available files are also listed below the data panel shown in Figure 5. Clicking on a file gives the option to open or save it as shown in Figure 7. There is also an option to export data and save it in a choice of formats.

Figure 5: Layer 1 showing list of WTPs

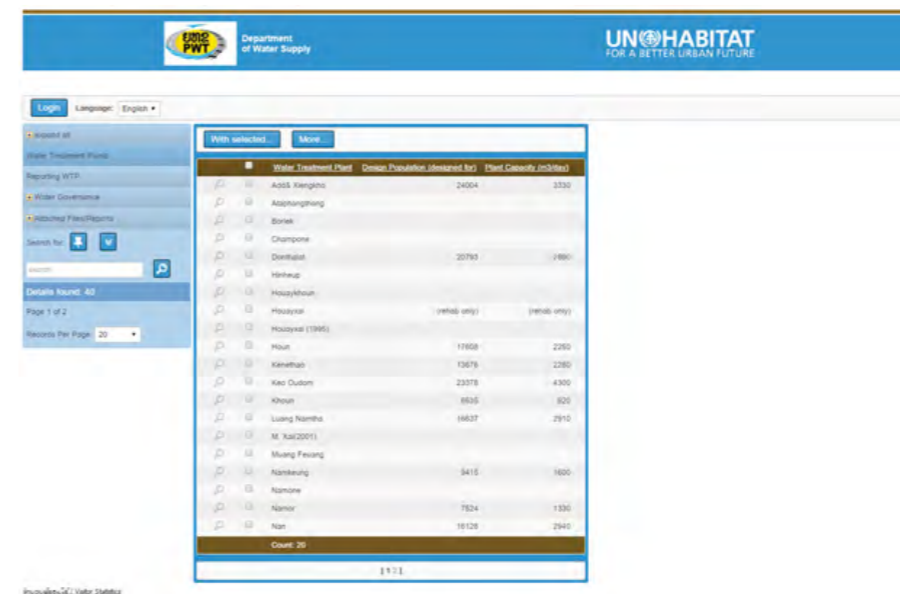


Figure 6: Layer 2 showing data held for a particular WTP

Water Treatment Plants, View record [ID: 41]

Water Treatment Plant	Donthalat
Design Population (designed for)	20793
Plant Capacity (m3/day)	2890
Water Treatment Plant Drawings	View Drawings
Final Design Report	View Report
Feasibility Study Report	View Report
Specifications Document	View File
Bill of Quantity	View File
Population by Village	View File
Demand Calculations	View File
Source Type	Mekong river
Year of Commission	2015
Total Cost	0.00â,
Cost per Capita	0.00â,

<<< Back to list >>>

Figure 8: Search option

Water Treatment Plants - Advanced search

Criteria: All conditions Any condition

NOT

Water Treatment Plant	<input type="checkbox"/>	Contains	<input type="text"/>
Design Population (designed for)	<input type="checkbox"/>	Less than	10000
Design Population extra	<input type="checkbox"/>	Contains	<input type="text"/>
Source Type	<input type="checkbox"/>	Contains	<input type="text"/>
Plant Capacity (m3/day)	<input type="checkbox"/>	Contains	<input type="text"/>
Plant Capacity extra	<input type="checkbox"/>	Contains	<input type="text"/>
Year of Commission	<input type="checkbox"/>	Contains	<input type="text"/>
Total Cost	<input type="checkbox"/>	Contains	<input type="text"/>
Cost per Capita	<input type="checkbox"/>	Contains	<input type="text"/>

Search Reset Back to list

Figure 7: Option to open or save a data file

Design Report Documents

Design Report File

41/reports/FinalDesignReport-Donthalat.doc

Feasibility Report

Feasibility Report File

41/reports/Don Talat Subproject.mpp

41/reports/Don Talat - Socio-economic Survey Report.docx

41/reports/Don Talat - Gender Plan.docx

41/reports/12June-Don Talat IEE-Attach J-2.2 Env. Schematic Descri

41/reports/Don Talat IEE Appendix J Report.doc

41/reports/Don Talat IEE-Attach J-0 Cover Sheet.doc

41/reports/Don Talat IEE-Attach J-0 Cover Sheet without WQ.doc

Opening 41_reports_FinalDesignReport-Donthalat.doc

You have chosen to open:

41_reports_FinalDesignReport-Donthalat.doc

which is a: Microsoft Word 97 - 2003 Document

from: http://202.144.189.125

What should Firefox do with this file?

Open with Microsoft Word (default)

Save File

Do this automatically for files like this from now on.

OK Cancel

Figure 9: Example of search results

<input type="checkbox"/>	Water Treatment Plant	Design Population (designed for)	Plant Capacity (m3/day)
<input type="checkbox"/>	Namkeung	9415	1600
<input type="checkbox"/>	Namor	7524	1330
<input type="checkbox"/>	Xamtay	9165	1270

View Count: 3

A search option allows the user to input the required parameters and search for WTPs which fit the selected criteria. Figure 8 shows a search for WTPs designed for a population of less than 10,000. If an additional criterion of a plant capacity of more than 1,000 m3/day is added, the search returns three WTPs, seen in Figure 9.



About Lessons From the Field

The Lessons From the Field is a Knowledge Management initiative established under the GoAL WaSH programme. The aim is to generate a collection of publications and other products, such as short films, that will gather knowledge of relevant national governance related processes that have occurred at country level during GoAL WaSH implementation.

The Lessons From the Field reports provide an in-depth look at the changes that these processes have triggered and the key aspects that made them possible. They are thus a special category in the Water Governance Facility Report series.



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